SECTION 09100

METAL SUPPORT ASSEMBLIES

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes
1. Metal studs and furring for support of gypsum board.
2. Suspended framing system for interior suspended ceilings.
3. Provision of backing for interior items to be attached to gypsum board and metal studs.
4. Provide engineering and inspection services for all resilient ceiling and wall isolator installations. An engineer retained by the manufacturer shall be responsible to provide detailed design of isolator installations in compliance with loading criteria defined by the project's structural engineer. Submit spacing of isolators for each wall and ceiling condition.

B. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

C. Related Sections
1. Section 07210 - Building Insulation: Provision of acoustical insulation within stud framing.
2. Section 07900 - Joint Sealers: Provision of sealants and caulks.
3. Section 09250 - Gypsum Board: Provision of gypsum board.

1.02 REFERENCES

A. ASTM - American Society for Testing and Materials
1. A568 - Standard Specification for Steel, Sheet, Carbon, and High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled, General Requirements for.
2. A641 - Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire.
3. A653 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
4. C645 - Standard Specification for Non-Load (Axial) Bearing Steel Studs, Runners (Track), and Rigid Furring Channels for Screw Application of Gypsum Board.
5. C653 - Standard Guide for Determination of the Thermal Resistance of Low-density Blanket Type Mineral Fiber Insulation.
6. C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Board.

B. CBC - California Building Code, 2001 Edition

C. GA - Gypsum Association
1. 203 - Installation of Screw-Type Steel Framing Members to Receive Gypsum Board.

D. Steel Stud Manufacturers Association (ICBO 4943P)

1.03 SYSTEM DESCRIPTION

A. Design Requirements
1. Metal stud framing system for interior walls and ceilings, with gypsum board specified in Section 09250.
2. Plumb, true, straight and rigid framing for support of attached materials.
3. Design system to accommodate construction tolerances, deflection of building structural members L/240, and support of attached materials and clearances of intended openings in accordance with CBC.
4. Gypsum board ceilings shall not support materials or building components other than grilles, light fixtures, small electrical conduits and small ducts. Such components shall be supported by supplemental framing which is supported by main runners. No vertical loads other than gypsum board dead load shall be applied to cross-furring.
5. Size acoustical ceiling isolators to comply with load and deflection requirements.

1.04 SUBMITTALS

A. Shop Drawings
1. Submit shop drawings indicating component details, framed openings, anchorage to structure and accessories or items required of other related work. Include shop drawings for backing plates for cabinets, grab bars and other wall mounted items.
2. Submit load calculation s at each acoustical ceiling isolator load condition keyed to shop drawings. Calculations to be stamped by California licensed Civil Engineer.
   a. Submit spacing of isolators for each ceiling condition.
   b. Submit load and deflection curves for isolator selections.
   c. Submit shop drawings indicating isolator selections, types, layout and seismic restraints.

1.05 QUALITY ASSURANCE

A. Perform work in accordance with GA 203 and ASTM C754, governing laws, building code requirements, manufacturer's printed recommendations and United States Gypsum company, "Good Design Practices" systems folder SA-923, 1994 Edition.

1.06 DELIVERY, STORAGE AND HANDLING

A. Storage and Protection
1. Deliver materials to job site and store in ventilated dry locations. If materials are stored outdoors, stack materials off the ground, supported on a level platform, and fully protected from the weather.
2. Handle materials carefully to prevent damage. Remove damaged items and provide new items.

PART 2 - PRODUCTS

2.01 MANUFACTURER

A. Acceptable Manufacturers
1. Steel Framing and Furring: Gold Bond Building Products Div., National Gypsum Co.; Clark Steel Framing; Dietrich Industries, Inc., or equal.

2. Grid Suspension Assemblies: Chicago Metallic Corp.; USG Interiors, Inc.; National Rolling Mills Co., or equal.
3. Steel Deck Insert: Fyre Sleeve Industries, Inc., "Q-Stop", or equal.

2.02 STEEL FRAMING FOR PARTITIONS

A. Studs: C-shaped, with galvanized coating ASTM A653, G-40; non-load bearing rolled steel, channel shaped, punched for utility access.
1. Width: As indicated.
2. Thickness: As indicated.
3. Tracks: Match stud grade.
4. Spacing: As indicated.

B. Deflection Tracks: Manufacturer's standard top runner designed to prevent cracking of gypsum board applied to interior partitions resulting from deflection of the structure above fabricated from steel sheet complying with ASTM A653 or ASTM A568. Thickness as indicated for studs and width to accommodate depth of studs and of the following configuration:
1. Top Runner with Slotted Flanges: 2-1/2 inch deep flanges with slots 1 inch on center.
2. Product: Sliptrack Systems, or approved equal.

C. Furring and Bracing Members: Same material and finish as studs, thickness to suit purpose.

D. Steel Rigid Furring Channels: ASTM C645, hat shaped, depth of 7/8-inch, and minimum thickness of base (uncoated) metal as follows:
1. Thickness: 0.0179-inch, unless otherwise indicated.
2. Protective Coating: ASTM A653, G 40 hot-dip galvanized coating.

E. Z-Furring Members: Manufacturer's standard Z-shaped furring members with slotted or nonslotted web, fabricated from steel sheet complying with ASTM A653 or ASTM A568; with a minimum base metal (uncoated) thickness of 0.0179-inch, face flange of 1-1/4 inch, wall-attachment flange of 7/8-inch, and of depth required to fit insulation thickness indicated.

F. Fasteners: Galvanized, GA 203, self-drilling, self-tapping screws.

G. Metal Backing Plates: As indicated.

H. Anchorage Devices: Provide anchors as indicated.

2.03 STEEL FRAMING COMPONENTS FOR SUSPENDED AND FURRED CEILINGS

A. General: Provide components of sizes indicated but not less than that required to comply with CBC and ASTM C754 for conditions indicated.

B. Wire for Hangers and Ties: ASTM A641, Class 1 zinc coating, soft temper.
1. Vertical Hanger Wires
   a. Accessible Ceiling: No. 8 gauge and galvanized.
   b. Non-Accessible Ceiling: No. 12 gauge wire and galvanized.

C. Angle-Type Hangers: Angles with legs not less than 7/8-inch wide, formed from 0.0635-inch thick galvanized steel sheet complying with ASTM A653, G40 Coating Designation, with bolted connections and 5/16-inch diameter bolts.

D. Channels: Cold-rolled steel, 0.0598-inch minimum thickness of base (uncoated) metal and 7/16-inch wide flanges, and as follows:
   1. Carrying Channels: 1-1/2 inches deep, 1.12 pound/foot minimum, hot rolled.
   2. Furring Channels: 7/8-inch deep, 26 gauge, galvanized hat sections at 24 inches maximum center to center.
   3. Finish: ASTM A653, G40 hot-dip galvanized coating for framing for exterior soffits.

E. Steel Studs for Furring Channels: ASTM C645, with flange edges bent back 90 degrees and doubled over to form 3/16-inch minimum lip (return), minimum thickness of base (uncoated) metal and minimum depth as follows:
   1. Thickness: 0.0179 inch, unless otherwise indicated.
   2. Depth: 1-5/8 inch, unless otherwise indicated.
   3. Protective Coating: ASTM A653, G40 hot-dip galvanized coating for framing for exterior soffits and ceiling suspension members in areas within 10 feet of exterior walls.

F. Resilient Channels: As manufactured by Unimast, "RC Deluxe"; Cemco, "RC-1"; Dale/Incor, "RFC-1", or approved equal.

2.04 MISCELLANEOUS MATERIALS

A. Acoustical Sealant: As specified in Section 07900.

B. Galvanized Finish Touch-Up Coating: Liquid zinc compound that bonds electrochemically to iron, steel and aluminum, as manufactured by ZRC Chemical Products, "ZRC Cold Galvanizing Compound", or equal.

2.05 FINISHES

A. Galvanized Surfaces: Where galvanizing is removed by welding or other assembly procedures, clean area of any foreign matter by wire brushing and metal conditioner recommended by galvanized finish touch-up manufacturer. Apply galvanized touch-up coating by brush or spray with minimum coverage of 1.4 mils, dry film.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine areas to receive metal support framing systems and verify the following:
   1. Installation of building components located in walls is complete.
   2. Backing plates are properly located for support of wall hung items.

B. Beginning of installation means installer accepts existing conditions.

3.02 PREPARATION

A. Ceiling Anchorages: Coordinate installation of ceiling suspension systems with installation of overhead structural assemblies to ensure that inserts and other provisions for anchorages to building structure have been installed to receive ceiling hangers that will develop their full strength and at spacing required to support ceilings.

1. Furnish concrete inserts and other devices indicated to other trades for installation well in advance of time needed for coordination with other construction.

3.03 INSTALLING STEEL FRAMING FOR PARTITIONS

A. Stud Partitions - Typical
   1. Align and secure top and bottom tracks.
   2. Fit tracks under and above openings; secure intermediate studs at spacing of wall studs.
   3. Install studs vertically at spacing as indicated.
   4. Connect studs to tracks using fastener method.
   5. Stud splicing is not permissible.
   6. Construct corners using minimum 3 studs.
   7. Double studs vertically at wall openings, door and window jambs and not more than 2 inches each side of openings, unless otherwise specified. Provide track and stud horizontally at wall, window head and sill openings.
   8. Brace stud framing system and make rigid.
   9. Coordinate erection of studs with requirements of door and window frame supports and attachments.
   10. Align stud web openings.
   11. Coordinate installation of jamb anchors and metal backing plates with electrical and mechanical work to be placed in or behind stud framing.
   12. Coordinate placement of insulation in multiple stud spaces made inaccessible after stud framing erection.
   13. Double Wall Partitions: Do not brace or connect rigid members across separation between stud rows. Use the specified resilient sway bracing only. At fire-rated conditions of 2 hours and less, conform to UL design U493.
   14. Steel Deck Seal: Provide inserts to plug steel deck flutes at full height sound rated partitions unless otherwise detailed.

B. Backing in Stud Partitions or Furring
   1. Typical: Securely weld or screw cut sections of unpunched stud to at least 3 stud supports, leaving flat surface of backing stud web to receive attachment of object to be secured to studs.
   2. Verify that any pre-drilling of backing and attachment of spacers to prevent crushing of attached material is done prior to application of attached material.
   3. If it is determined by the Architect that backing was not provided for any items as required, the Contractor shall remove the finish materials; install backing and shall patch and refinish surface to match adjacent area and surface at no additional cost to the District.

C. Installation of Resilient Channel
   1. Attach resilient channels perpendicular to framing and spaced as follows, unless otherwise required by Code:
      a. Where Framing Is Spaced 24 Inches on Center: Attach resilient channels on 16 inch centers.
      b. Where Framing Is Spaced 16 Inches on Center: Attach resilient channels on 24 inch centers.
   2. Drive screws only through pre-punched holes in channels.
   3. Attach resilient channels with mounting flanges facing in only one direction. Orient the gap between the channel and stud faces upward on walls.
   4. Hold back ends of channels 1 to 3 inches from intersecting surfaces.
   5. Splice channels only at joists and overlap ends.

6. Locate channels so that gypsum board will not be cantilevered more than 6 inches from vertical surfaces.
7. Resilient channel only to bear load of gypsum board, unless indicted otherwise.

D. Installation Tolerances: Install each steel framing and furring member so that fastening surfaces do not vary more than 1/8-inch from plane of faces of adjacent framing.

E. Curved Partitions
1. Cut top and bottom track (runners) through leg and web at 2 inch intervals for arc length. In cutting lengths of track, allow for uncut straight lengths of not less than 12 inches at ends of arcs.
2. Bend track to uniform curve and locate straight lengths so they are tangent to arcs.
3. Support outside (cut) leg of track by clinching steel sheet strip, 1 inch high by thickness of track metal, to inside of cut legs using metal lock fasteners.
4. Begin and end each arc with a stud, and space intermediate studs equally along arcs at stud spacing recommended in writing by gypsum board manufacturer for radii indicated. On straight lengths of not less than 2 studs at ends of arcs, place studs 6 inches on center.

3.04 INSTALLING STEEL FRAMING FOR SUSPENDED AND FURRED CEILINGS

A. Suspend ceiling hangers from building structural members and as follows:
1. Hangers shall be saddle-tied around main runners to develop full strength of hangers.
2. Cross-furring shall be saddle-tied to main runners with 1 strand of No. 16 or 2 strands of No. 18 gauge tie wire.
3. Main runners shall be spliced by lapping and interlocking flanges 12 inches minimum and tying near each end with double loops of No. 16 gauge wire.
4. Cross-furring shall be spliced by lapping and interlocking the pieces 8 inches minimum and tying near each end with double loops of No. 16 gauge wire.
5. Fasten hanger wires with not less than 3 tight turns. Fasten bracing wires with 4 tight turns. Make all tight turns within a distance of 1-1/2 inches. Hanger or bracing wire anchors to the structure shall be installed in such a manner that the direction of the wire aligns as closely as possible with direction of the forces acting on the wire.
   a. Wire turns made by machine where both strands have been deformed or bent in wrapping can waive the 1-1/2 inch requirement, but the number of turns shall be maintained, and be as tight as possible.
6. Separate all ceiling hanging and bracing wires at least 6 inches from all unbraced ducts, pipes, and conduit. It is acceptable to attach lightweight items, such as single electrical conduit not exceeding 3/4-inch nominal diameter to hanger wires using connectors acceptable to authorities of jurisdiction.
7. When drilled-in concrete anchors are used in reinforced concrete for hanger wires, 1 out of 10 shall be field tested for 200 pounds of tension. When drilled-in concrete anchors are used for bracing wires, 1 out of 2 shall be field tested for 440 pounds in tension. Shot-in anchors in concrete are not permitted.
8. Provide trapeze or other supplementary support members at obstructions to main hanger spacing.
9. Provide additional hangers, struts or braces as required at all ceiling breaks, soffits or discontinuous areas.
10. Hanger wires that are more than 1 in 6 out of plumb shall have counter-sloping wires.
11. Resilient Ceilings
   a. Select resilient hangers for proper loading, as required to achieve a minimum 0.20-inch static deflection.

b. Incorporate cables with resilient hangers at diagonal bracing where cable is in tension.
c. Ceiling hanger wires, support rods and framing shall not contact ducts, pipes, equipment or supports.
d. Isolation hardware shall not be concealed until approval is obtained from the Architect.

B. Light Fixture Support
1. Recessed or drop-in light fixtures shall be supported directly by main runners or by supplemental framing which is supported by main runners.
2. Surface mounted fixtures shall be attached to main runner by positive clamping device made of material with a minimum of 14 gauges. Rotational spring catches do not comply.
3. Light fixtures, HVAC diffusers, speakers, etc., shall have minimum 2 wires at opposite ends for support if ceiling should fail during seismic fault.

C. Installation Tolerances: Install steel framing components for suspended ceilings so that cross-furring members or grid suspension members are level to within 1/8-inch in 12 feet as measured both lengthwise on each member and transversely between parallel members.

END OF SECTION